

**DIGITAL PRE-DISTORTION FOR THE LINEARIZATION OF
POWER AMPLIFIERS WITH ASYMMETRICAL CHARACTERISTICS**

ABSTRACT OF THE DISCLOSURE

5 Pre-distortion, whose magnitude -- and preferably phase -- are frequency-dependent, is applied to
an input signal in order to reduce spurious emissions resulting from subsequent amplification of the
signal. In preferred embodiments, the pre-distortion technique of the present invention is implemented in
combination with the (frequency-independent) magnitude and phase pre-distortion technique described in
U.S. Patent Application No. 09/395,490 ("the '490 application"), where the frequency-dependent pre-
10 distortion corresponds to amplifier distortion that has a magnitude that is proportional to the frequency
offset from the carrier frequency and a phase shift of $\pm 90^\circ$ on either side of the carrier frequency. The
frequency-dependent pre-distortion is generated by differentiating waveforms corresponding to two
different sets of pre-distortion parameters with respect to time. One of the differentiated waveforms is
applied to a positive-frequency filter and the other to a negative-frequency filter to generate positive- and
15 negative-frequency pre-distortion signals, respectively, to account for asymmetries in the amplifier
characteristics.